

## CLAIMS

### What Is Claimed Is:

- 1 1. A navigation device comprising:  
2 an electronic compass to detect an orientation and provide a corresponding heading  
3 signal;  
4 one or more motion sensing devices to detect motion along different axis and provide  
5 corresponding motion signals; and  
6 a processing unit communicatively coupled to the electronic compass and one or more  
7 motion sensing devices to received the heading signal and one or more motion signals, determine  
8 a position and orientation, and automatically provide different navigation information depending  
9 on the orientation of the navigation device.
- 1 2. The navigation device of claim 1 wherein the processing unit is further configured to  
2 provide different navigation information depending on whether the navigation device is affixed  
3 to a user or not.
- 1 3. The navigation device of claim 2 further comprising:  
2 a visible indicator to provide navigation information to a user; and  
3 a holster to affix the navigation device to a user..
- 1 4. The navigation device of claim 1 wherein the navigation device automatically switches  
2 between different modes of operation depending on the orientation of the navigation device,  
3 and provide either heading or position information, depending on the mode of operation.
- 1 5. The navigation device of claim 1 wherein  
2 if the navigation device is affixed to a user and the device is in a primary orientation,  
3 navigation calculations are made according to bipedal ambulation to provide a position,  
4 if the navigation device is affixed to a user and the device is in a secondary orientation,  
5 then navigation calculations are made according to crawling ambulation to provide a position,  
6 and

7 if the navigation device is hand-held, only azimuth data is provided to the user.

1 6. The navigation device of claim 1 further comprising:  
2 a communication port to transmit navigation information.

1 7. A method of navigation comprising:  
2 determining whether a navigation device is affixed to a user;  
3 obtaining an azimuth heading;  
4 calculating a dead reckoning position if the navigation device is affixed to the user;  
5 providing azimuth heading and dead reckoning position if the navigation device is affixed  
6 to the user; and  
7 providing azimuth heading otherwise.

1 8. The method of claim 7 further comprising:  
2 determining an orientation of the navigation device relative to a horizontal plane;  
3 calculating the dead reckoning position according to bipedal ambulation when the  
4 navigation device is affixed to the user and is in a first orientation; and  
5 calculation the dead reckoning position according to crawling ambulation when the  
6 navigation device is affixed to the user and is in a second orientation.

1 9. A method comprising:  
2 determining the orientation of a navigation device;  
3 automatically selecting a first motion measurement algorithm if the navigation device is  
4 in a first orientation;  
5 automatically selecting a second motion measurement algorithm if the navigation device  
6 is in a second orientation; and  
7 providing a position according to the pedometry algorithm selected.

1 10. The method of claim 9 wherein the orientation of the navigation device is determined  
2 relative to a horizontal plane.

1 11. The method of claim 9 further comprising:

2 determining if the navigation device is affixed to a user;  
3 automatically selecting the first motion measurement algorithm if the navigation device is  
4 in the first orientation and affixed to the user;  
5 automatically selecting the second motion measurement algorithm if the navigation  
6 device is in the second orientation and affixed to the user; and  
7 suspending all motion measurement calculations if the navigation device is not affixed to  
8 the user.

1 12. A machine-readable medium having one or more instructions for dead reckoning  
2 navigation, which when executed by a processor, causes the processor to perform operations  
3 comprising  
4 determining whether a navigation device is affixed to a user;  
5 obtaining an azimuth heading;  
6 calculating a dead reckoning position if the navigation device is affixed to the user;  
7 outputting the azimuth heading and dead reckoning position if the navigation device is  
8 affixed to the user; and  
9 outputting the azimuth heading otherwise.

1 13. The machine-readable medium of claim 12 to further:  
2 determining an orientation of the navigation device relative to a horizontal plane,  
3 calculating the dead reckoning position according to bipedal ambulation when the  
4 navigation device is affixed to the user and is in a first orientation, and  
5 calculation the dead reckoning position according to crawling ambulation when the  
6 navigation device is affixed to the user and is in a second orientation.